

PATENT  
P54508CLEAN VERSION OF AMENDMENTSIN THE CLAIMS

Please amend claims 1, and 6 through 8, to read as follows:

1 (five times amended). A redundant array of inexpensive disks (RAID) level 5  
memory system, comprising:  
a plurality of defect-adaptive memory devices, each of said plurality of defect-adaptive  
memory devices having a first region for sequentially storing parity information  
for data recovery and a second region for storing data;  
a plurality of caches, each of said plurality of caches respectively coupled operatively to a  
corresponding single unique one of said plurality of defect-adaptive memory  
devices, each of said plurality of caches adapted for storing parity information for  
data recovery for a corresponding single unique one of said plurality of defect-  
adaptive memory devices to provide one-to-one caching; and  
a controller operatively coupled to each defect-adaptive memory device of said plurality  
of defect-adaptive memory devices and to each corresponding single unique cache  
of said plurality of caches, said controller comprising a first means for selectively  
controlling writing and reading of parity information needed for data recovery in  
said first region of each corresponding single unique one of said plurality of

PATENT  
P54508

16 defect-adaptive memory devices, a second means for selectively obtaining parity  
17 information needed for data recovery from said first region of each corresponding  
18 single unique one of said plurality of defect-adaptive memory devices, and a third  
19 means for selectively storing parity information needed for data recovery obtained  
20 from said first region of a corresponding single unique one of said plurality of  
21 defect-adaptive memory devices in a predetermined corresponding single unique  
22 one of said plurality of caches.

Sub  
G1 6 (five times amended). A redundant array of inexpensive disks (RAID) level 5  
2 system, comprising:  
3 a plurality of disk drives, each of said plurality of disk drives including a first region  
4 having a plurality of data blocks for storing data and a second region having a  
5 predetermined number of parity blocks for storing parity information for data  
6 recovery;  
7 a plurality of caches, each of said plurality of caches respectively coupled operatively to a  
8 corresponding single unique one of said plurality of disk drives, each of said  
9 caches adapted for storing parity information for data recovery; and  
10 a controller adapted to provide one-to-one caching, said controller operatively coupled to  
11 each disk drive of said plurality of disk drives and to each corresponding single

PATENT  
P54508

12 unique cache of said plurality of caches, said controller adapted for selectively  
13 controlling a write operation of data and parity information for a data recovery in  
14 each corresponding disk drive of said plurality of disk drives, said controller  
15 comprising:

16 a first means for selecting a single predetermined disk drive of said plurality  
17 of disk drives upon receipt of a data writing instruction from a host  
18 computer;

19 a second means for reading old data from the single predetermined disk  
20 drive of said plurality of disk drives;

21 a third means for determining whether old parity information corresponding  
22 to the old data corresponding to the single predetermined disk drive  
23 of said plurality of disk drives is accessed in a corresponding single  
24 unique cache of said plurality of caches;

25 a fourth means for reading the old parity information from the single pre-  
26 determined disk drive of said plurality of disk drives, upon the old  
27 parity information corresponding to the single predetermined disk  
28 drive of said plurality of disk drives not being accessed in the  
29 corresponding single unique cache of said plurality of caches, and for  
30 then loading the corresponding single unique cache of said plurality

PATENT  
P54508

31 of caches with the old parity information;  
32 a fifth means for obtaining new parity information by performing an  
33 exclusive OR operation on the old data, the old parity information  
34 and new data;  
35 a sixth means for loading the corresponding single unique cache of said  
36 plurality of caches with the new parity information; and  
37 a seventh means for writing the new data in said region for storing data in  
38 the single predetermined disk drive of said plurality of disk drives  
39 and writing the new parity information in said another region for  
40 storing parity information in the predetermined single disk drive of  
41 said plurality of disk drives,  
42 whereby the data writing process is completed.

1 7 (amended). In a method of writing data to, and reading data from, a redundant  
2 array of inexpensive disks (RAID) level 5 system, said method comprising steps for se-  
3 quentially storing information for data recovery in a first region of a disk, storing  
4 information comprising data in a second region of the disk other than the first region,  
5 controlling writing and reading of information by means of an electronic controller unit,  
6 and caching information for data recovery, *the improvement comprising a step for*

PATENT  
P54508

7 reducing overhead during a read operation for data recovery and thereby improving data  
8 input-output performance.

1 8 (amended). The method of claim 7, wherein said step for reducing overhead dur-  
2 ing a read operation for data recovery and thereby improving data input-output perfor-  
3 mance comprises steps for:

4 (a) coupling each one of a plurality of caches to each corresponding one of a  
5 plurality of disks, whereby each disk is coupled one-to-one to one cache;

6 (b) operatively coupling the caches to the controller;

7 (c) storing in each one of the plurality of caches information for data recovery in  
8 the disk corresponding to the cache; and

9 (d) determining information for data recovery in a disk by using information for  
10 data recovery stored in the cache corresponding to the disk.